



Can the Intel® Pentium® 4 Processor with HT Technology make your business PCs work as hard as your business?

Your company is working harder than ever—and so are your business PCs. IT-oriented background services such as virus scans, file encryption and e-mail compression make the computing infrastructure more robust, but add to the load on the PC. Applications and operating systems are more feature-rich and power-hungry, and users increasingly multitask among browsers, e-mail and productivity applications.

Between multitasking and background processing, business computing demands a new approach to performance—to keep systems responsive and users operating at peak efficiency.

Now, Intel brings its exclusive Hyper-Threading (HT) Technology to the desktop, meeting these demands and giving business users the power to do more at once. Pioneered on Intel's advanced server processors and supported now on a range of Intel® Pentium® 4 processors, HT Technology empowers the PC client with advanced performance that delivers immediate business value. In fact, a Pentium 4 processor-based PC at 3 GHz, with the Intel® 865G chipset and HT Technology enabled, demonstrated more than a *sixfold* performance boost on the SYSmark® benchmark over an Intel® Pentium® III processor-based PC.¹

Hyper-Threading Technology at a glance

What: Groundbreaking technology that gives business PC users the ability to do more in less time.

Why: Because it takes more than just fast clock speeds to deliver productivity in today's multitasking environments.

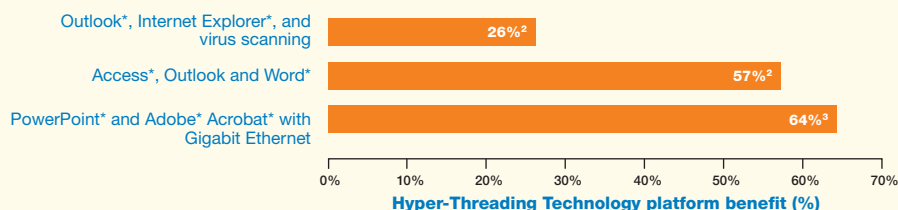
How: A single Intel® Pentium® 4 processor supporting Hyper-Threading Technology presents itself to modern operating systems and applications as two virtual processors. The processor can work on two sets of tasks simultaneously, use resources that otherwise would sit idle and get more work done in the same amount of time—like you would if you were reading a book while riding an exercise bike.

Impact: Immediate performance boosts—up to 25% for many applications and workloads.

- Added power that lets IT run background services like virus scanning and file compression without impacting end-user productivity.
- Increased system responsiveness in multitasking environments.
- Enhanced performance for Gigabit Ethernet (GbE) to the desktop.

www.intel.com/info/hyperthreading

New Hyper-Threading Technology platforms boost performance in multitasking environments



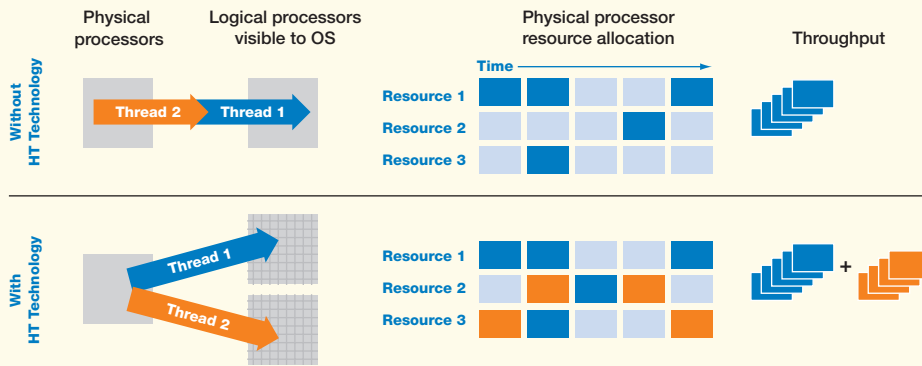
² Comparison between Intel® Pentium® 4 processor 2.80 GHz/533 and Intel® Pentium® 4 Processor with HT Technology 2.80 GHz/800

³ Comparison between Intel® Pentium® 4 processor 2.80 GHz/533 with Intel® PRO/1000 MT Desktop Connection and Intel® Pentium® 4 Processor with HT Technology 2.80 GHz/800 with Intel® PRO/1000 MT Desktop Connection

Source: Intel® Configuration. Intel® Pentium® 4 processor 2.80 GHz/533 MHz – Intel® 865G Desktop Board, 512-MB DDR333 CL2.5-3-3; Intel® Pentium® 4 Processor with HT Technology 2.80C GHz/800 MHz – Intel 865G Desktop Board, 512-MB DDR333 CL2.5-3-3; All Platforms Except Pentium III Processor Integrated graphics with Intel® Extreme Graphics 2, Graphics Driver Beta Candidate 6.13.01.3314, Microsoft® Default UDMA-5, Intel® Chipset Software Installation Utility 5.00.1003 beta, IBM® 80GB 120GXP IC35L080AVVA07-0 ATA-100 Hard Drive; Intel® C & FORTRAN compilers 6.0 for SPEC, DirectX® 8.1, Windows® XP Build 2600 SP1, 100 Mbps Intel® Pro/100+ Management PCI LAN Card. Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance.



How Hyper-Threading Technology works



Greater resource utilization equals greater performance and responsiveness

Advanced productivity for a multitasking world

With HT Technology, business users can make the most of Windows* XP's Preemptive Multitasking Architecture. They can run the most demanding applications simultaneously while maintaining system responsiveness, getting more performance out of existing software in multitasking environments and with multithreaded applications. And there's no need for new application software to enjoy the benefits.

IT departments can deploy the desktop background services that make their environments more secure, efficient and manageable—while minimizing the impact on end-user productivity. On an older PC powered by an Intel Pentium III processor, a manager who's converting a large PowerPoint* file to PDF format that contains scanned images and charts will notice a considerable performance hit if a virus checker is simultaneously scanning the hard drive. Put that same workload on a PC powered by an Intel Pentium 4 processor at 2.80 GHz, and the work gets done 4.5 times faster. And on a Pentium 4 processor at 3 GHz with HT Technology enabled, the performance boost is 5.7 times, delivering maximum productivity for the user and maximum assurance for IT.¹

Intel has worked closely with leading software companies to architect their next-generation solutions to maximize HT Technology benefits. By buying PCs based on the Intel Pentium 4 Processor with HT Technology, you enjoy great productivity on current applications and are poised to experience outstanding performance as these new solutions come to market.

Doing double duty—how Hyper-Threading Technology works

Faster clock speeds are an important way to deliver more computing power, and Intel has led the way with steady increases in processor beat rates. But clock speed is only half

the story. The other route to higher performance is to accomplish more work on each clock cycle, and that's where HT Technology comes in. HT Technology enhances the Intel Pentium 4 processor's state-of-the-art design to utilize its execution resources more efficiently—and deliver performance increases of up to 25%.

HT Technology takes advantage of the multithreading capability that's built into Windows XP and many advanced applications. Multithreaded software divides its workloads into processes and threads that can be independently scheduled and dispatched. In a multiprocessor system, those threads execute on different processors. HT Technology allows a single Pentium 4 processor to function as two virtual or logical processors. There's still just one physical Pentium 4 processor in your PC—but the processor can execute two threads simultaneously.

While some execution resources are shared, including caches, execution units and buses, each logical processor has its own architecture state, with its own set of general-purpose registers, control registers and so forth—producing big performance advantages for multitasking environments and multithreaded applications alike. Bottom line: Performance that's perfect for today's business users.

Get ready

Hyper-Threading Technology requires a computer system with an Intel Pentium 4 processor supporting Hyper-Threading Technology, an HT Technology-enabled chipset and BIOS, and HT Technology-optimized operating system such as Microsoft* Windows XP or certain versions of Linux*. To ensure the PCs you buy deliver the benefits of Hyper-Threading Technology, look for systems with the Intel Pentium 4 Processor with HT Technology logo, which indicates your vendor has verified the system supports HT Technology. See <http://www.intel.com/info/hyperthreading/> for more information, including details on which processors support HT Technology.

For more information www.intel.com/info/hyperthreading

¹ Source: Intel® Configuration: Intel® Pentium® III processor at 500 MHz—Intel® Desktop Board SE440BX-2, 128-MB PC100 CL2 SDRAM, Leadtek® WinFast GeForce® 3/ nVidia® GeForce 3 4x AGP Graphics, nVidia Detonator® 3 reference driver 21.81, IBM DTLA-307030 30GB ATA-100 Hard Drive, Intel® Application Accelerator v1.1, Windows XP default driver Ultra DMA Mode 2; Intel® Pentium® 4 processor 2.80 GHz/533 MHz—Intel® 865G Desktop Board, 512-MB DDR333 CL2.5-3-3; Intel® Pentium® 4 Processor with HT Technology 2.80 GHz/800 MHz, 3 GHz/800 MHz—Intel® 865G Desktop Board, 512-MB DDR333 CL2.5-3-3; All Platforms Except Pentium III Processor Integrated graphics with Intel® Extreme Graphics, Graphics Driver Beta Candidate 6.13.01.3314, Microsoft® Default UDMA-5, Intel® Chipset Software Installation Utility 5.00.1003 beta, IBM 80GB 120GXP IC35L080AVVA07-0 ATA-100 Hard Drive; Intel® C & FORTRAN compilers 6.0 for SPEC, DirectX 8.1, Windows XP Build 2600 SP1, 100 Mbps Intel® Pro/100+ Management PCI LAN Card. Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance.

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